

Message

From: Vulimiri, Suryanarayana [Vulimiri.Sury@epa.gov]
Sent: 3/1/2013 2:00:19 PM
To: Whalan, John [Whalan.John@epa.gov]; Glenn, Barbara [Glenn.Barbara@epa.gov]
CC: Sonawane, Bob [Sonawane.Bob@epa.gov]
Subject: FW: What's new for 'formaldehyde' in PubMed

Hi John,

Good Morning. Just saw this article from Spanel 2013. I ordered this article from the library. I will send it to you as soon as I got. Looks like some new information on exhaled breath formaldehyde.

Sury

From: My NCBI [mailto:efback@mail.nih.gov]
Sent: Friday, March 01, 2013 7:40 AM
To: Vulimiri, Suryanarayana
Subject: What's new for 'formaldehyde' in PubMed

This message contains My NCBI what's new results from the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM).
Do not reply directly to this message.

Sender's message: Formaldehyde alerts for Sury:

Sent on Friday, 2013 March 01
Search: **formaldehyde**

Click [here](#) to view complete results in PubMed (Results may change over time.)
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PubMed Results

Item 1 of 1

1. J Breath Res. 2013 Mar;7(1):017106. doi: 10.1088/1752-7155/7/1/017106. Epub 2013 Feb 27.

A quantitative study of the influence of inhaled compounds on their concentrations in exhaled breath.

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Abstract

Throughout the development of breath analysis research, there has been interest in how the concentrations of trace compounds in exhaled breath are related to their concentrations in the ambient inhaled air. In considering this, Phillips introduced the concept of 'alveolar gradient' and judged that the measured exhaled concentrations of volatile organic compounds should be diminished by an amount equal to their concentrations in the inhaled ambient air. The objective of the work described in this paper was to investigate this relationship quantitatively. Thus, experiments have been carried out in which inhaled air was polluted by seven compounds of interest in breath research, as given below, and exhaled breath has been analysed by SIFT-MS as the concentrations of these compounds in the inhaled air were reduced. The interesting result obtained is that all the exogenous compounds are partially retained in the exhaled breath and there are close linear relationships between the exhaled and inhaled air concentrations for all seven compounds. Thus, retention coefficients, a , have been derived for the following compounds: pentane, 0.76 ± 0.09 ; isoprene, 0.66 ± 0.04 ; acetone, 0.17 ± 0.03 ; ammonia, 0.70 ± 0.13 , methanol, 0.29 ± 0.02 ; formaldehyde, 0.06 ± 0.03 ; deuterated water (HDO), 0.09 ± 0.02 . From these data, correction to breath analyses for inhaled concentration can be described by coefficients specific to each compound, which can be close to 1 for hydrocarbons, as applied by Phillips, or around 0.1, meaning that inhaled concentrations of such compounds can essentially be neglected. A further deduction from the experimental data is that under conditions of the inhalation of clean air, the measured exhaled breath concentrations of those compounds should be increased by a factor of $1/(1 - a)$ to correspond to gaseous equilibrium with the compounds dissolved in the mixed venous blood entering the alveoli. Thus, for isoprene, this is a factor of 3, which we have confirmed experimentally by re-breathing experiments.

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